we have already noticed. In March 1845, as also in April 1844, the author, in demonstrating what is the principle concerned in the transformation of amylaceous substances and of cellulose into glucose, pointed out one of the principal effects of this tranformation. Admitting, first, that the influence of alkalies gives to solutions of glucose the power of reducing binoxide of copper, and then considering that the assimilation of amylaceous and saccharine principles is possible only in the presence of alkalies, M. Mialhe attributed the diabetic affection to defect in the assimilation of sugar, rather than to an increased production of this immediate principle. These new views, in accordance with a large number of previous practical observations, seemed to recommend, (in combination with an animal diet, and the use of the smallest possible quantity of feculent matter,) the employment of alkaline bases, or their carbonates, of magnesia, or even of lime-water. In support of this ingenious hypothesis, M. Mialhe points out how the presence of an alkaline base (already employed by Frommerz) hastens or determines the deoxydizing action of solutions of glucose. An analogous reaction, necessary in order that saccharine matters may take part in nutrition, appeared to him to be checked, in diabetic affections, by a greater or less want of an alkaline base, which would occasion the excretion of a greater or less quantity of glucose, and would correspond to more or less severe forms of the disease. The author noticed, in a functional affection, this deficiency in the alkaline condition of the blood, and that the morbid phenomena returned so soon as the alkaline mode of treatment was discontinued. Examples of cure, or of marked improvement, under the influence of the method indicated, are described by the author, and appear worthy of interest, though they are not sufficiently numerous; all the circumstances of the phenomena, which are in themselves so complex, it has not yet been possible to study in a manner sufficiently precise to remove all doubt on this point. The report concludes by recommending the Academy to engage M. Mialhe to continue his experimental investigations on the theory and treatment of diabetes mellitus.—(*London Med. Gaz.*, May 1846, from *Comptes Rendus*, March 23, 1846.)

2. *Digestion.*—The No. of the *Dublin Quarterly Journal of Med. Science* for August last, contains a very able sketch, by Dr. J. O. Curran, of what is novel regarding the physiology of the digestive process, illustrated by such facts, from various sources, as bear immediately on the more disputed points; and the author presents the following as the most correct theory of the process.

"*In the mouth*, albuminous matters are merely divided, so as to facilitate deglutition, and to prepare them for solution in the gastric juice, by exposing a greater surface to the action of that solvent. Fatty matters combine and form an emulsion with a little of the alkali of the saliva, but the amount of change of this kind is quite unimportant. Sugar undergoes no change, being merely dissolved in the water of the saliva. Amylaceous substances are broken up and triturated between the broad crowns of the molars, in order to promote their thorough admixture with the saliva, and to rupture the cortical envelop of the starch grains; the latter effect being much facilitated by the temperature under which mastication is carried on. The saliva, meantime, being poured out in profusion, in consequence of the irritation to which the extremities of the salivary ducts are subjected by the food, by means of a principle analogous to diastase, and under the influence of its own alkalinity, acts chemically on the fecula, converting it into dextrine and glucose, and thereby rendering it soluble. Only part of the starch, however, undergoes this change in the mouth; the rest, mingled with the alimentary bolus, is, after a certain time, collected into a ball, and by the combined action of the tongue and cheeks, is thrown back into the pharynx, when the excito-motor action of the constrictors quickly carries it to the stomach, without its undergoing any farther change.

"*In the stomach*, the presence of the food causes the most intense turgidity of the mucous membrane to take place instantly, during which the acids and certain salts of the blood, together with a solution of a peculiar organic substance, are thrown out by exhibition from the papillæ uncovered by epithelium. By this fluid the albuminous elements of our food are dissolved, and their chemical characters are somewhat changed. Saccharine matters are also, by contact with the mem-

brane, and under the influence of the acids of the stomach, in part converted into lactic acid, and both are absorbed by the veins of the stomach. The fat set free by the solution of the areolar tissue, in which it was confined, and liquefied by the heat, is, by the muscular action of the stomach, conveyed along with the other unchanged alimentary matters into the duodenum.

"*In the small intestine* the bile forms an emulsion with the fluid fat, which emulsion, being absorbed by the lacteals, gives to those vessels their characteristic colour. The pancreatic juice reacts on the starch, and converts it into dextrine and glucose: a portion of these are then farther transformed, by contact with the mucous membrane, into lactic acid, and the branches of the mesenteric veins, ramifying on the intestine, keep absorbing the lactic acid, dextrine, glucose, cane sugar, and the other soluble matters presented to them.

"*Large Intestines.*—In the rest of the alimentary canal the same process of absorption goes on, but the only chemical change which is there effected is the formation of lactic acid from the cane and diabetic sugar which had passed unchanged from the upper part of the tube. The matters taken up by the veins of the stomach and intestines, being conveyed by the vena porta to the liver, the superfluous glucose, and other ingredients, are again returned to the intestines in the bile, to be afresh absorbed, and conveyed to the liver, to go through the same changes, thus giving time for those transformations to be effected in the blood which are necessary to complete assimilation. When more of substances not prepared for entering into the blood is carried to the liver, than that organ is capable of throwing off, the kidneys take on a part of its action, and the glucose or albumen, that has got furtively into the circulation, is excreted along with the urine.

"The above views suggest the following pretty analogies:* *In plants*, starch can only minister to nutrition by being rendered soluble by a ferment (diastase), which is secreted, not in the radicles nor in the shoots, but just where theory tells us it ought to be, close to the germ. In like manner, *in animals* starch cannot be assimilated until it has been similarly acted on, and diastase is found in the mouth and the intestines.

"*Vegetables* cannot appropriate to their support the neutral hydro-carbons until the alkali contained in the soil has transformed these substances into others which are soluble, and chiefly into ulmine. *Animals* also can only apply to the uses of their organism these same substances after they have been acted on by the alkalies of the vital fluid, and ulmine is one of the products of the reaction.

"*In vegetables* the vital fluid, the sap, is always neutral or acid; in healthy *animals* the blood is always alkaline.

"In healthy *vegetables* the sap contains glucose; in healthy *animals* the blood contains no glucose.

"In some *diseased animals* (glucosuria), however, the blood is both acid and contains glucose, and in some *diseased plants*† the sap becomes alkaline, and contains no glucose."

ORGANIC CHEMISTRY.

3. *On the Presence of Sugar in Healthy Blood.*—By M. Magendie. For some years past the attention of chemists has been directed to the remarkable property possessed by certain organic substances, of acting in the manner of ferments on other organic substances—and of transforming them into proximate principles such as glucose, dextrine, sugar of milk, lactic acid, butyric acid, &c. Numerous

* Chiefly from M. Mialhe, but with him not altogether original, the same analogy of some urinary diseases to the normal state in vegetables having been hinted at by Cuvier in his Report on the Progress of Science, 1810.

† The curious experiments of M. E. Fremy are here referred to. If plants be regularly watered with a weak alkaline solution, the glucose is found to disappear entirely from the sap, which then presents an alkaline reaction. See *Comptes Rendus de l'Académie des Sciences*, 8re, 1844, p. 784.